What is claimed is:

1. A particle, comprising: a core particle and at least one substance comprising magnetic material and polymeric material, wherein the amount of magnetic material in the substance ranges from greater than 0% to nearly 100% of the substance, and the amount of magnetic material associated with the particle is chosen to achieve a desired magnetic response.

2. A particle according to claim 1, wherein the core particle is a microsphere or bead.

3. A particle according to claim 2, wherein the microsphere or bead ranges in size from about 1μm to about 100μm.

4. A particle according to claim 1, wherein the at least one substance is a polymeric magnetic nanosphere.

5. A particle according to claim 4, wherein the size of the nanosphere and the amount of the nanosphere is chosen to achieve the desired magnetic response.

6. A particle, comprising: at least one magnetic substance in an amount effective for achieving a desired magnetic response, and a core particle.

7. A particle according to claim 6, further comprising at least one reactant.

8. A particle according to claim 7, wherein the at least one reactant has a surface-reactive moiety chosen from amines, thiols, carboxylic acids, hydrazines, halides, alcohols, and aldehydes.

9. A particle according to claim 6, wherein the at least one magnetic substance is chosen from ferromagnetic, paramagnetic and superparamagnetic materials.

10. A particle according to claim 6, wherein the at least one magnetic substance includes a magnetic component chosen from magnetite, hematite, chromium dioxide, and ferrite alloys.

11. A particle according to claim 6, wherein the magnetic substance has a magnetic content ranging from greater than 0% to 100%.

12. A particle according to claim 6, wherein the magnetic substance further comprises polymeric material.

13. A particle according to claim 12, the magnetic substance comprising a core of 100% magnetic material and a coating comprising polymeric material.

14. A particle according to claim 6, wherein the at least one magnetic substance is chosen from magnetic nanospheres.

15. A particle according to claim 14, further comprising non-magnetic nanospheres.

16. A particle according to claim 15, wherein the core particle is uniformly coated with the at least one magnetic substance.

17. A particle according to claim 6, wherein the core particle is uniformly coated with the at least one magnetic substance.

18. A particle according to claim 17, wherein the core particle is completely coated with the at least one magnetic substance.

19. A particle according to claim 6, further comprising at least one fluorescent tag.

20. A set of particles, comprising: pooled populations of particles, the particles comprising at least one magnetic substance in amount effective for achieving a desired magnetic response, a first population of particles being distinguishable from another population of particles based at least on the magnetic response of the particles within the first population.

21. A method of forming magnetically-responsive particles, comprising: associating with a particle at least one magnetic substance in an amount effective for achieving a desired magnetic response.

22. A method according to claim 21, wherein the at least one magnetic substance is covalently linked to a core particle.

23. A method according to claim 21, wherein the at least one magnetic substance is chosen from magnetic microspheres.

24. A method according to claim 23, wherein the size and number of the magnetic microspheres determines the amount effective for achieving a desired magnetic response.

25. A method of forming a magnetically-responsive population of particles, comprising:

selecting an amount of magnetic substance for achieving a desired magnetic response; and

associating the amount of magnetic substance with core particles.

26. A method according to claim 25, wherein the magnetic substance is chosen from magnetic nanospheres, and the amount of magnetic substance is selected by choosing the size of the microspheres, the type of magnetic content of the microspheres, the concentration of magnetic content of the magnetic microspheres, and the number of microspheres.

27. A method of forming a pooled set of magnetically-responsive populations of particles, comprising:

combining a population of particles having a desired magnetic response with at least one other population of particles having a different desired magnetic response.

28. A method according to claim 27, wherein the magnetic response relates to the amount of at least one magnetic substance within or associated with core particles in a population.